

28. A method according to claim 25, wherein the interlayer insulating film is formed by plasma chemical vapor deposition using an organic silane.

29. A method according to claim 25, wherein the interlayer insulating film includes halogen at a concentration of $1 \times 10^{17} \text{ cm}^{-3}$ or more.--

REMARKS

At the outset, the Examiner is thanked for her thorough review and consideration of the present application.

The Examiner's non-final Office Action dated June 21, 2000 has been received and its contents carefully noted. Claims 1-20 are pending in the present application. By this amendment, claims 2, 10, 13, 14, and 18 have been amended, and claims 21-29 have been added. Accordingly, claims 1-29 are pending in the subject application, of which claims 1, 8, 13, 17, and 25 are independent.

Claims 1-20 stand rejected under the judicially created doctrine of double patenting over claims 1-27 of U.S. Patent 5,821,138 ('138 patent). Applicants respectfully traverse the rejection.

The present invention is characterized by a method of forming an insulating film including a halogen element and carbon, and a method of producing a semiconductor device having the insulating film.

Applicants respectfully submit that, in the '138 patent, claims 3, 9, 14 and 20 cite a concentration of halogen and/or hydrogen in a crystalline silicon film or monocrystal-like region. Moreover, although claim 23 indicates forming a thermal oxide film in an oxidizing atmosphere containing a halogen element, and claim 26 shows some gases for the oxidizing atmosphere with the halogen element, no claim in the '138 patent includes the limitation of the halogen concentration and the carbon concentration in the insulating film comprising silicon oxide, as recited in independent claims 1, 8, 13, 17, and 25 of the present application. Thus, the double patent rejection of claims 1-20 is insupportable and requested to be reconsidered and withdrawn.

New claims 21-29 have been added with no new matter to complete the scope of the invention to which Applicants are entitled. Claim 25 recites an interlayer insulating film comprising the halogen element and carbon at the claimed concentrations.

Support for newly added claims 21-24 and 25-29 can be found in the specification. For example, an interlayer insulating film 209 of silicon oxide is formed, as recited in claim 28, is found in at least page 13, lines 21-25. The silicon oxide film is characterized in having a concentration from 1×10^{17} to $5 \times 10^{20} \text{ cm}^{-3}$ of halogens and from $5 \times 10^{19} \text{ cm}^{-3}$ or less of carbon, as described, in which can be found in at least, e.g., page 2, line 29 through page 17. More specifically, the silicon film may be obtained using an organic silane having ethoxy groups, oxygen, and hydrogen chloride or a chlorine containing hydrocarbon as raw material.

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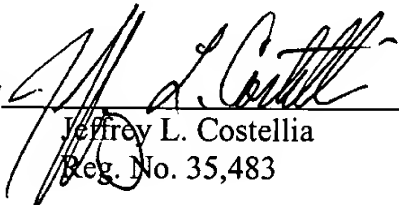
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CONCLUSION

Having responded to all rejections set forth in the outstanding non-final Office Action, it is submitted that claims 1-29 are now in condition for allowance. An early and favorable Notice of Allowance is respectfully solicited. In the event that the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, the Examiner is courteously requested to contact Applicant's undersigned representative.

Respectfully submitted,

NIXON PEABODY, LLP

By 
Jeffrey L. Costellia
Reg. No. 35,483

JLC/LCD/dlt

8180 Greensboro Drive, Suite 800
McLean, Virginia 22102
Telephone: (703) 790-9110
Facsimile: (703) 883-0370

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